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J. W. BISHOP'S

PATENT AUTOMATIC

FIRE EXTINGUISHING

APPARATUS.

ADAPTED TO ANY CLASS OF BUILDING OR VESSEL.

ALWAYS RELIABLE.

J. F. GILBERT & CO.,

MANUFACTURERS AND AGENTS,

479 STATE STREET, NEW HAVEN, CONN.

NEW HAVEN:

ALEX. CRAIG, Printer, (Bishop's Building), 489 State Street.

1881.

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AUTOMATIC FIRE EXTINGUISHING
APPARATUS.

ADAPTED TO ANY CLASS OF BUILDING OR VESSEL.

NO MATTER WHAT THE CONDITION OF THE WATER SUPPLY OR
WHETHER THE PREMISES ARE HEATED OR NOT, MY FIRE
APPARATUS WILL NOT FREEZE UP BUT WILL ALWAYS
BE IN PERFECT CONDITION TO PUT OUT A FIRE
WHENEVER ONE MAY OCCUR.

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(58)



This book I dedicate to the business public, especially to owners of property and men of enterprise, believing the age demands that class and kind of facilities for the protection of property which this circular illustrates and sets forth. Trusting that the perusal of its pages will compensate for the time so spent and that the information, if any, contained therein may be of some practical advantage to the reader,

I remain yours, respectfully,

J. W. BISHOP.



THE SCIENCE OF EXTINGUISHING FIRES.

Experiments and actual fires in some of our largest cotton and planing mills demonstrate the fact that violent conflagrations may be extinguished by very small quantities of water. The flame of any burning substance must cease, according to well-known principles and experiments, whenever by any means the air is prevented from touching its surface. When a small quantity of water is thrown upon a body in a state of conflagration, the water is at once partially reduced to vapor, which, rising from the surface of the burning substance, repels the air and consequently represses the flame, which for the same reason cannot again appear while the production of the vapor continues.

After numerous tests and long study of and familiarity with fire extinguishing apparatus I do not fear to make the following statement, viz., that the automatic system of protection, consisting of a system of pipes running through the apartments of a building and having at suitable intervals sprinklers or distributors of water, so constructed as to be operated by the action of the heat generated by the fire at only those points where the fire is located, thereby preventing damage by water to the parts of a building or room in which there is no fire, as would be the case under the ordinary way of extinguishing by hose or open pipes, is the most effective method of putting out a fire at its commencement, thus preventing and making impossible a large fire or very considerable amount of damage and loss.

There have been many fires in warehouses, mills and factories, where the automatic system has been applied, and in no instance has it failed to put out the fire promptly and with very little damage to either the building or its contents. Another advantage of great importance is the fact that the interruption of business, which in the case of an extensive fire is often the cause of greater loss than the loss resulting from direct destruction of property, is, in consequence of the very trifling extent of the fire when controlled by the automatic system, almost entirely prevented.

Property protected by the automatic system can be insured on the Factory Mutual Plan, at very low rates, so as to make it largely for the interest of property owners to insure in that manner and by so doing they will, in a few years, save the cost of fitting up.

Parties desiring to see the practical working of the apparatus can do so by calling on me, when I will be pleased to make any test that they may

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wish to see, in a building erected for that purpose, and if they would like to see a trial of either of my devices by the side of any other device for the same purpose it will give me pleasure to show up their merits under your own supervision and direction.

I have several inventions recently made and secured by letters patent that will meet the requirements of any kind of building, no matter how situated or what its condition, whether there be a water supply under a pressure or not. I have devices that I will warrant to extinguish a fire under any condition as far as the water supply is concerned, provided it is possible to get water from a well. It is not necessary to have tanks in the attic or towers, neither is it necessary that water should be in the pipes, to corrode them, thereby forming sediment which is liable to stop up the small perforations made in the sprinklers which some use, or to prevent the revolving sprinklers from turning as it sometimes does, thus preventing a proper distribution of water, or to corrode or coat over the fusible solder that seals the sprinkler, thereby preventing the solder from fusing at as low a temperature as it otherwise would, it being a fact well known to every plumber that pipes containing water will coat over, in time, with a deposit that is a non-conductor of heat. With the water *out* of the pipes there can be no freezing and bursting, no leakage of water from any cause, and the pipes can be so arranged as to get the water on the fire in *less time* than would be taken with the water *in* the pipes.

If you have a building that you want protected against fire and you do not want to be at the expense of heating it to keep the pipes from freezing, and have no steam boiler or steam pump but have a water power, I can fit up your building, with or without using your present wheel, and give you the whole available supply of your pond to extinguish the fire.

If you have a building, part of which is heated and part not heated, I can fit it up so that there will be no trouble from freezing. Or, if you have no water supply under pressure, and have a good well and steam boiler, I can make for you a perfect job without tanks in the attic.

If you have a store, warehouse, or any nicely finished building, where pipes running through the rooms would be unsightly, I can fit it up so that the job would be ornamental rather than otherwise.

If you have any public building, school, asylum, hospital, prison, theatre or hotel, I have the apparatus adapted to any of them.

If you have elevators, no matter how much exposed to cold and frost, they can be protected against damage by fire.

I have an apparatus adapted to steamboats or vessels of any kind, that any sailor or boat hand can manage, which will put out a fire before serious damage could be done.

If any parties would like to have their property protected provided they were persuaded that any of my fire extinguishers would do as stated, and want to be informed in regard thereto, in any particular, if they will tell me what they want, and what the premises are, I will gladly give them the information they require; or, if they will call on me, I will give an exhibition of the practical working of the apparatus.

A full description of the various parts of my apparatus, with illustrative cuts, is given in this book.

SPECIAL NOTICE.

It has come to my notice that a certain person which has been engaged in stirring up feelings with anonymous fire extinguishers, feeling, no doubt, aggrieved by the knowledge of the fact that they have a competitor in the market who has a better thing, covering a larger field and certainly free and clear of any and all of the process which they control, and which under tests, side by side with theirs and others, has borne off the palm, a statement of the trade both in New Haven, Conn., and in Chelsea, Mass., has been published and widely circulated; have made statements, as follows, in part: first where I have put up my extinguishers and in others with whom I, or my agents, have been negotiating, namely, that they own, by virtue of patents, the system of Automatic Fire Extinguishing and that they should sue them for damages, and that they had better not have any other apparatus than that which they put in, and other statements to the same effect, when the fact is, if I am correctly so judge in the matter having consulted with competent patent counsellors and experts and having their written opinion, that the system is *not* their patent and so far as the system goes it is *public property*.

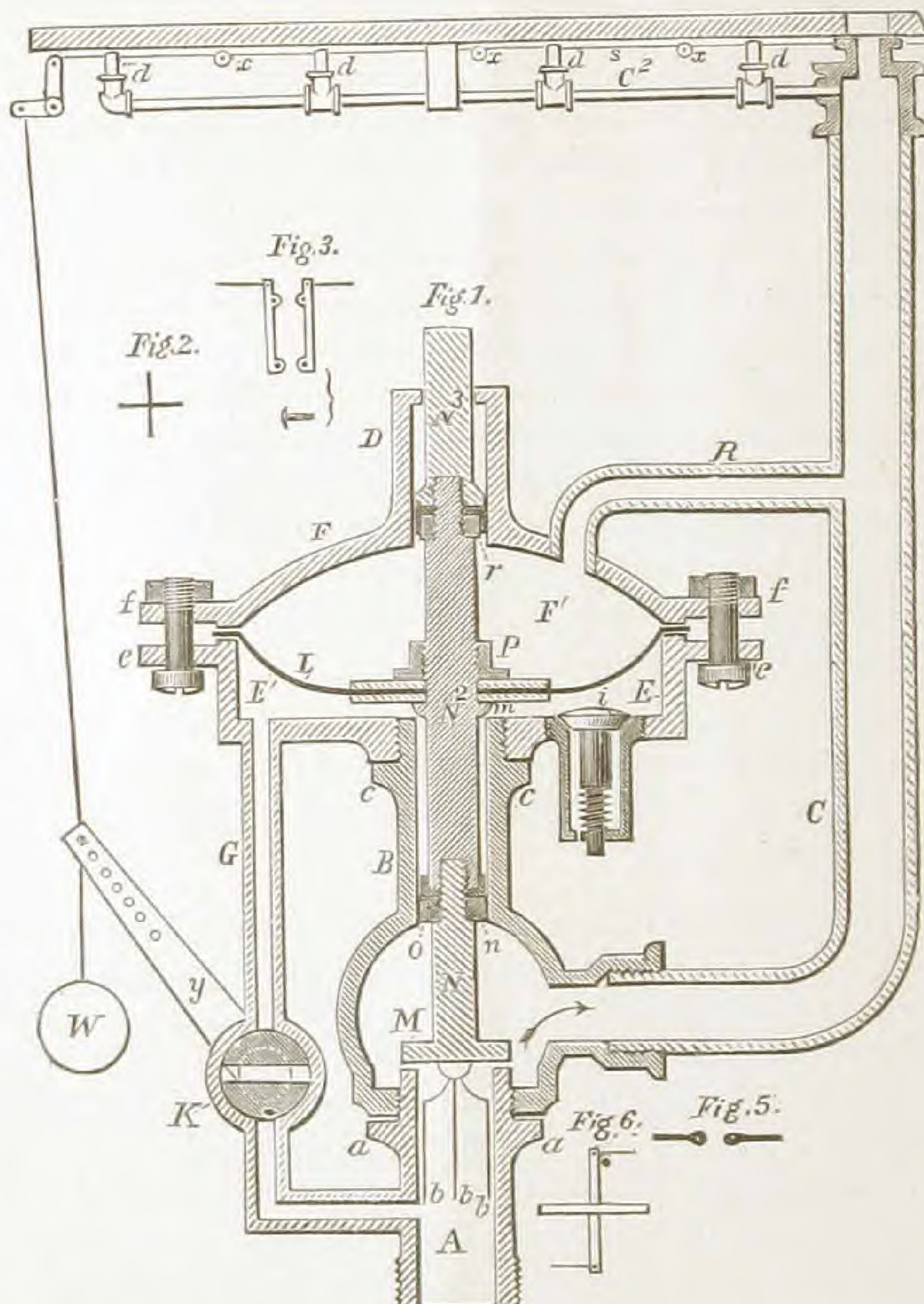
As for the matter of running a system of pipes about a building, having revolving distributors for the extinguishers of fire, this fact that was done in this country I put in myself, long before the method was used by them, was ever thought of by them.

But parties to whom they have made these statements and demands have not taken the same as readily as was expected and my apparatus is meeting with general favor, first, because it is better, second, because it costs less and will do better operation; third, it covers a larger field than they ever dreamed of; fourth, because it is a well known fact that I have a perfect ground of defense against any suit for infringement of my patents they have and that, financially, I am able to defend my rights and to have them, too, any and all parties that use any of my devices. I am a man of honor and have them to declare to any suit that may be brought against me for infringement: it would be a suit of no value, like a *quadrangle* without change. I earnestly invite the house to whom I refer in this article to come to a suit at their earliest convenience, and I pledge myself to give the matter my devoted and undivided attention. I think it would be interesting and greatly to their credit to carry out their threats and prove the statements which they have made; it would at least show that they were acting in good faith and that there was ground for the statements which they have so freely made, but as the matter now stands it looks too much like a game of bluff to take well with the public.

J. W. HANCOCK

DESCRIPTION
OF
J. W. BISHOP'S PATENT AUTOMATIC FIRE EXTINGUISHER.

No. 1.



The above cut (No. 1) is a sectional view of one of my devices for protecting buildings against serious loss by fire, representing a fire extinguisher that excludes the water from the building and pipes until needed to put out a fire.

Figure 1 is a governor valve controlling the water supply.

A is a pipe which is connected to a pipe leading to a main in the street, or to the source of water supply. It has the shoulders *a*, and in it the fins *b*, (shown in Fig. 1 and in cross section, Fig. 2) move, to steady the valve *M* and its stem.

The pipe *B* has the shoulders *c*, and has its lower end enlarged into a form nearly spherical, as shown, and is screwed to the pipe *A*.

C is the main pipe in the building, into which the smaller pipes on which the distributors are arranged, are inserted, and connects with the enlarged part of pipe *B*.

E is a large cylindrical vessel. It has the flange *e*, and is secured to the pipe *B*. It is connected to the pipe *A* by the pipe *G*, in which is the cock *K*, operated by the arm *y*, on which is the weight *W*. The pipe *G* may be connected to the pipe *C*, and its operation would be the same. It has the valve *i*, on the stem of which is a light spiral spring of sufficient strength to keep the valve open when there is no water pressure upon it. The function of this valve is to let water out of the vessel *E* in case of leakage. A like valve may be arranged in the pipe *C*, above the point to which the water rises to close the diaphragm or valve *M*.

F is a dome-shaped piece of the same diameter as the vessel *E*, and has the flange *f* of the same size as flange *e*. Through these flanges bolts pass into threaded nuts to hold the flanges together. From the central part of the dome-shaped piece *F* the pipe *D* extends.

L is an elastic diaphragm held between the vessel *E* and piece *F*, as shown, through which the stem passes and divides the chamber formed by vessel *E* and piece *F* into two parts or chambers.

The valve *M* closes the pipe *A*, the end of the pipe being the valve seat. To the valve is attached the fins *b*, before-mentioned. The stem *N* of the valve has a shoulder on which the collar *n* rests, and is packed in the pipe *B* by the packing *o*; its upper end being threaded. The stem *N*² is secured on the upper end of the stem *N*, and has its lower end packed, as shown. It also has the shoulder or enlargement *m* on which a plate rests between which and another plate of the same size, the diaphragm *L* is held by the nut *P*. Its upper end is threaded and has the collar *r*, which is packed in the pipe *D*. The stem *N*³ is secured on to the upper end of stem *N*² and projects above pipe *D*. To its upper end a fire alarm may be attached.

A whistle may be attached to the system of pipes at any desired point, to be operated by the escape of the air contained in the pipes when the water is admitted into them.

The pipe *R* connects the dome-shaped piece *F* with pipe *C*. The pipe *C*² is connected with pipe *C*, and on it, or on fittings connecting its parts, the distributors are arranged.

The wire *s* is connected by joints *x* made by a bolt (shown in Fig. 3) of fusible metal, as alloys which melt at a low temperature are called, passing through holes made in the flattened ends of wire, as shown in Fig. 5.

The connecting link (Fig. 3) consists of two strips or bars of metal, hinged at their lower ends by an iron bolt passing through holes in the bars, or in any other suitable way; the upper ends of the pieces being held together by a bolt of fusible metal passing through holes in the upper parts; or the upper parts may be soldered together. The bolt or solder being melted the connecting wire is lengthened by the length of both pieces and the connection is unbroken.

In Fig. 6 a modification of the connecting link is shown, consisting of an upright bar soldered to a horizontal bar by fusible metal, which being melted the connecting wire is lengthened the length of the bar, the connection being

unbroken, as before. The bar may be pivoted in the middle, and a pin of fusible metal may be inserted in the wall to keep it from turning, as shown.

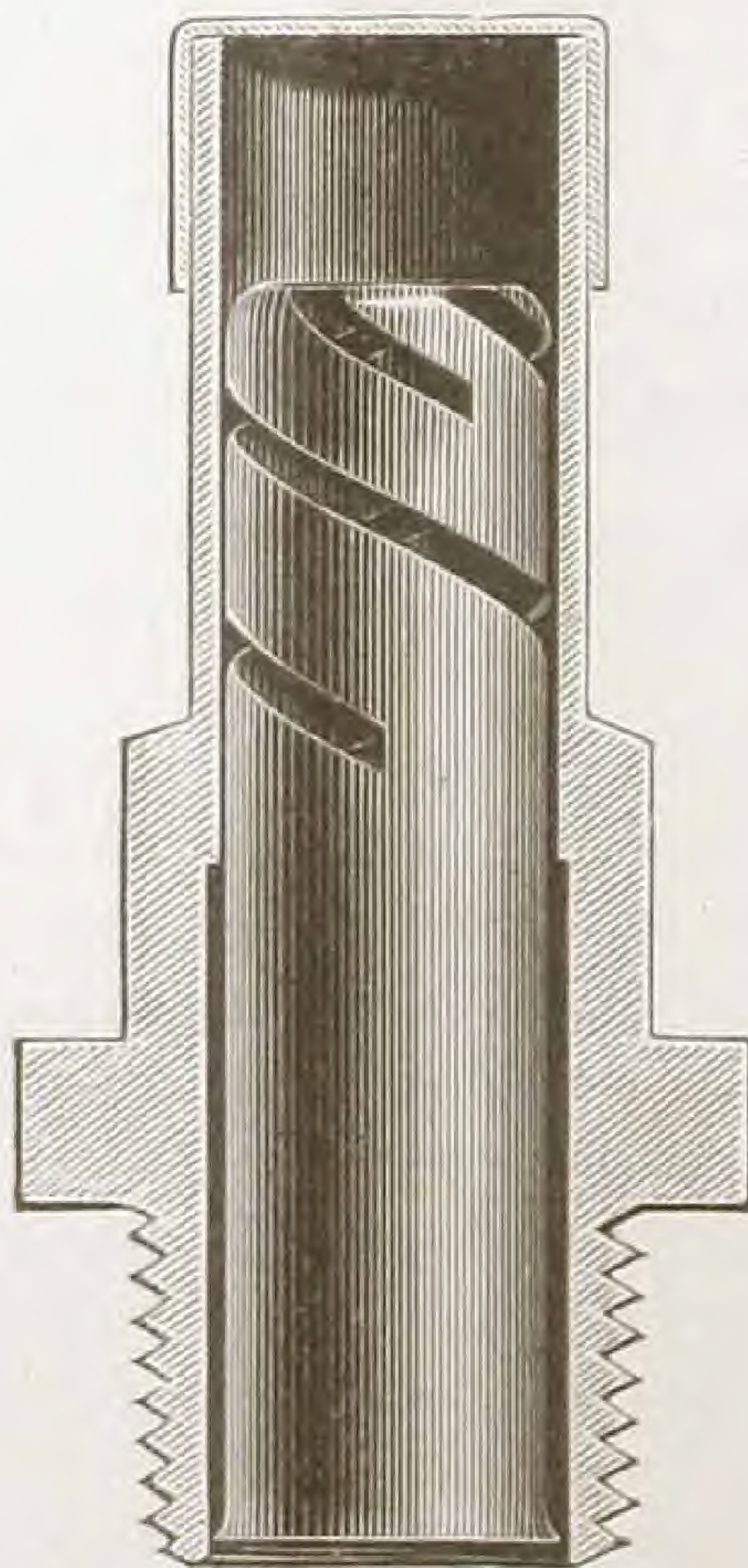
OPERATION OF EXTINGUISHING APPARATUS.

The extinguisher, being constructed as described, will operate as follows:

The water coming against the valve *M* opens it, and flows through pipes *C* and *R* into the chamber *F*, fills the chamber and rises in pipe *C* until the pressure on diaphragm closes the valve.

To be more explicit, if the area of the valve is a square inch and the water pressure upon it is forty pounds to the square inch, and if the area of the diaphragm is forty square inches, the water will fill the chamber *F* and rise in the pipe *C* until pressure on the diaphragm is more than a pound to the square inch, when the water pressure on the diaphragm will exceed the water pressure on the valve, and close it. To make a pressure of a pound to the square inch on the diaphragm the water in the pipe *C* must rise about twenty-six inches above the diaphragm. When the distributor is liberated by heat, and when any one of the fusible joints in the wires are melted, the arm *Y* descends and opens the cock *K*, and the water flows through the pipe *G* into chamber *E* and creates a water pressure on the underside of the diaphragm equal to the pressure on its upper side, and the water flows through the pipe *C* in the same manner as though the devices for excluding the water from the building formed no part of the extinguisher.

No. 2.



Cut No. 2 is one of my distributors, which is represented in cut No. 1 by the letters *dd*.

This distributor is a hollow cylinder or tube fitted loosely in the end of the conduit pipe; it has an enlargement on its lower end and suitable perforations in its upper end. A cap is placed over the end of the conduit pipe and secured thereto by a solder that melts at a low degree of heat. In the space between the end of the perforated tube and the cap there may be placed a non-conducting material, which will prevent the water from coming in contact with the surface upon which the cap is soldered, thus facilitating the melting of the solder.

In the conduit pipe there are shoulders which limit the motion of the distributor by means of the enlargement on its lower end.

The operation of the distributor is as follows:

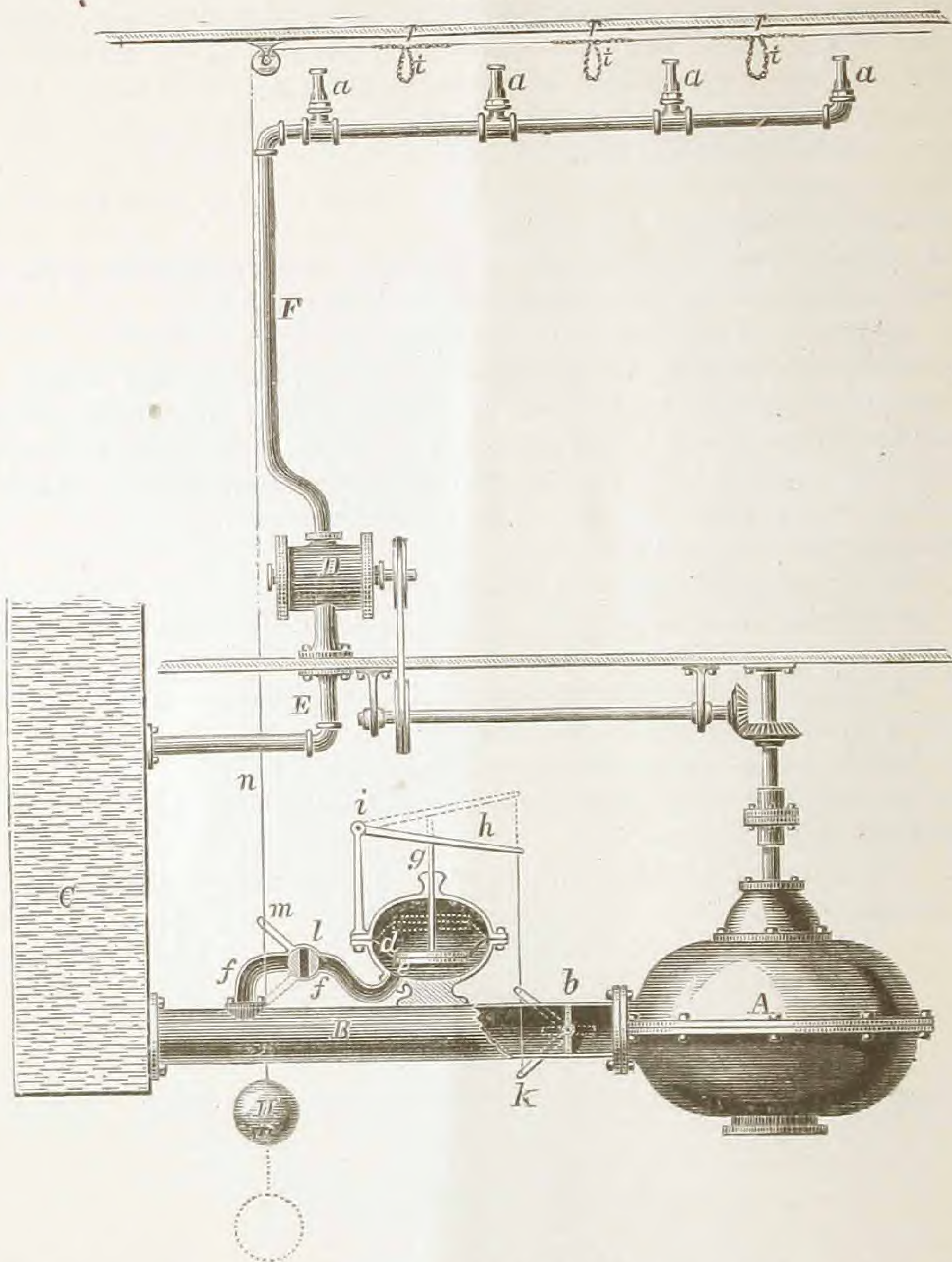
As soon as the temperature is sufficient to melt the fusible solder, say 155°, the water pressure in the conduit pipe forces the cap off and the distributor up above the end of the pipe, and the water is showered on the fire, wetting only where the fire is, thus saving damage from water, which attends almost every other method of fire extinguishment.

The advantages claimed are—

- 1st. *No corrosion of pipes or the fusible material.*
- 2d. *No damage from freezing or leakage, as there is no water in the pipes until a fire occurs.*
- 3d. *No stopping up of distributors by rust or sediment, which would be formed by water remaining in the pipes.*
- 4th. *It will give an alarm only in case of fire.*
- 5th. *It cannot get out of order so as not to put out a fire. It will give timely notice in case of an accident.*
- 6th. *The distributor will deliver more water over greater space than any other in use.*

NO HEATING OF BUILDINGS OR WATER UNDER HEAD NECESSARY.

Cut No. 3 (on following page) is a view of another of my extinguishers, showing another device for controlling the supply of water to the pipes and distributors. The object of this invention is to dispense with water-works or tanks and adapt the apparatus to large manufactories where power is readily obtained, by means of which the supply of water may be forced into the pipes whenever and wherever a fire occurs. The invention consists essentially of a force pump drawing water and discharging into the distributing pipe, combined with power connected with the pump and a mechanism leading to the different points to be protected, by means of which the heat generated by the fire, when it occurs, will apply the power to the pump and instantly supply water through the distributors at the point where the fire occurs.



In the cut, *A* represents a water wheel receiving water through a pipe, *B*, from the flume, *C*, in the usual manner for turbine wheels; *D* represents a rotary pump connected by gearing to the wheel shaft so that the revolutions of the wheel impart corresponding motion to the pump which will draw water from the flume, *C*, through the pipe, *E*, and discharge it into the pipe *F*, which leads to the different parts of the building and is provided at different points with distributors, *a*, in the usual manner for this class of fire extinguishers. The supply of water to the wheel through the pipe, *B*, is cut off by a gate or valve, *b*, which is to be automatically opened whenever a fire occurs.

As a suitable device for operating this valve I here represent a flexible diaphragm, *d*, in a chamber, *e*, to which water is admitted beneath the diaphragm through a tube, *f*; this diaphragm is furnished with a spindle, *g*,

sprinkling devices. The distributor proper is entirely encased within the conduit pipe and over the end is a cap secured to the conduit pipe by easily fusible solder which, when heated to about 160° , releases the cap and the pressure of the water forces it off, the distributor rises so that the spiral slots are above the end of the conduit pipe and an unrestricted flow of water issues through the slots covering a large space. Under a pressure of twenty pounds to the square inch it will thoroughly wet down a surface from thirty to forty feet in diameter forming a perfect spray or shower, completely filling that diameter from ceiling to floor. The advantage which this distributor has over all others is that it *does not revolve* but rises up out of the conduit pipe or casing that surrounds it and remains in a fixed position, while the spiral slots around it and upon its upper end throw the water in an unbroken sheet and spray in all directions. The slots being longer than in any other kind they will not choke up as will those that have only straight slots or small perforations and they will not fail to distribute the water in all directions, which the revolving class does fail to do when a little sediment or corrosion holds them in a fixed position, in which case they only throw the water in a line with the slots or perforations leaving a space untouched between the streams from ten to twenty feet across, a practical demonstration of which I will be pleased to give anyone that may be pleased to call upon me for that purpose. I am not confined to this particular construction of a distributor but have a number of my own invention covering all the different forms and methods of distribution, a few of which you will find illustrated on the following pages.

It may be well to state here that either of my devices will let the water on to the fire when the temperature in the room at the points where the distributors are located attains to 160° to 200° and that it requires about 550° of heat to ignite pine; it must therefore be evident to anyone that will give the matter a moment's consideration that it is impossible to have a serious fire when the apparatus is properly put up.

It will be apparent that the devices shown in this book are arranged to exclude the water from the pipes and the building in which they are until it is needed to extinguish a fire. A few of the advantages derived from such a system are these: there can be no possible damage to goods, machinery or building, by the bursting or leakage of pipes occasioned by freezing or accident; there will be no corrosion of the pipes, thereby forming a sediment or deposit to choke up the openings in the distributors, just at the time when they are needed to put out a fire; in case of fire the fusible connections will be released much sooner than they would with the water in the pipes and the water will be discharged on the fire in less time; the pipes will last longer and be attended with less expense for repairs; the apparatus will never refuse to act because the pipes are never frozen up.

If parties are willing to take the chances of freezing and leakage, corrosion and damage of pipes, etc., and would be satisfied with a job done as has been the custom heretofore, I am ready to fit them up and will give them a job as good and effective as can be done in that way, at a figure as low as any other responsible person or house can do it and make a fair profit.

To either of my devices I have an alarm attached, either a whistle or

gong, that will give an alarm whenever a fire occurs. My alarms are absolutely reliable and will not make a mistake and give a false alarm, as has frequently been the case with means heretofore employed and abandoned because of their frequent operation occasioned by variable pressure in the pipes.

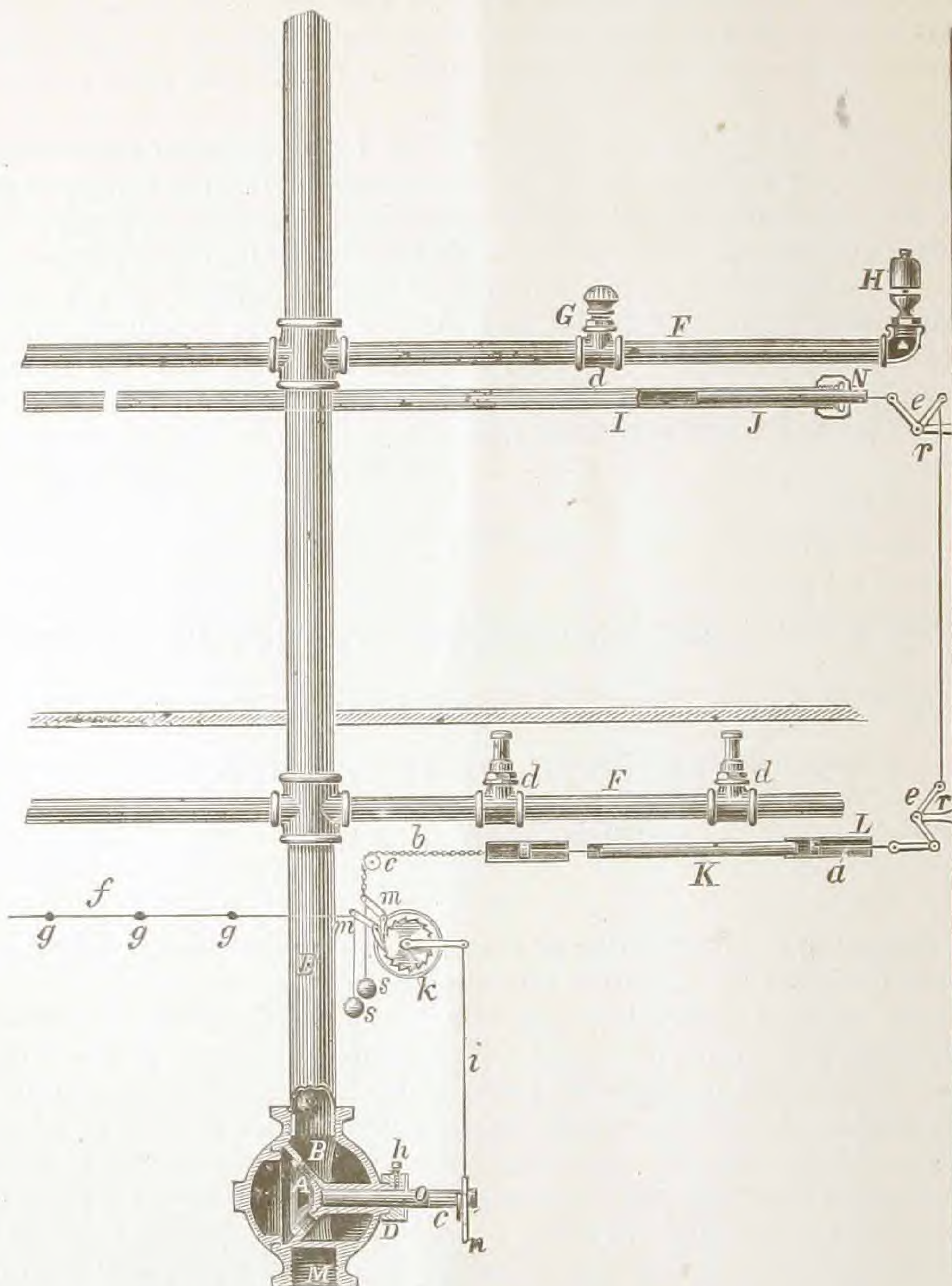
After careful investigation of the various extinguishers on the market and thorough tests of their merits the committee having the matter of protecting the Exposition Building at Atlanta, Ga., against fire, in charge, have purchased and put up my apparatus in preference to all others. My several devices for extinguishing fire will also be on exhibition in a building erected especially for my own use, in which I shall give frequent practical tests of their working and effectiveness. I shall also show the working of some other devices not my own, in order that parties interested may see the difference and where real merit lies.

ANOTHER FIRE EXTINGUISHING APPARATUS BY WHICH THE WATER IS EXCLUDED FROM THE SYSTEM OF PIPES UNTIL IT IS NEEDED TO EXTINGUISH A FIRE.

The following is a description of the extinguisher and its operation: (see sectional view, cut No. 4, on the following page).

M is the end of a rotary balanced valve chamber to which is connected the water main or source of supply. *V* is a conical valve having the conical seat, *B*, in which it rotates when the water is admitted into the pipe, *E*, and the branch pipes, *F*, in which the sprinklers, *G*, are inserted at suitable intervals. *H* is a whistle, also inserted in the system of pipes at such a point as may be desired, and is operated, whenever the water is let into the pipes, by the expulsion of the air contained in the pipes (by the force of the water) through the whistle, thus sounding the alarm which will continue until the water strikes the valve at the lower end of the whistle, carrying it to its seat, when the alarm will cease and the water be prevented from discharging through the whistle.

On the valve spindle, *C*, is the guide, *D*, through which passes the set screw, *A*, the object of which is to govern the throw or motion of the valve; the end of the spindle, marked *a*, is ratchetted for some length to accommodate one or more arms bearing pawls that match into the teeth on the spindle; *a* shows an arm, to the end of which a wire or connecting link, *i*, is attached; the other end of the link, *i*, is attached to the arm of the ratchet shaft, *k*. The releasing device, *L*, consists of a tube containing the piston, *J*, and having a packing joint, *N*, on its end, by which means a tight joint is made around the piston; the tube is filled with water or other fluid and the operation is



as follows: When a fire occurs the fluid, by the absorption of heat, expands and forces out the piston, thereby releasing the tension upon all intermediate connections between it and the arm, *m*, on the ratchet shaft, *k*, leaving said arm to the action of the weight, *s*, which being free to descend, and being also connected with the arm, *m*, in its descent rotates the ratchet shaft, *k*, thereby giving an upward movement to the end of the arm attached to the center of the ratchet shaft, by which means motion is communicated to the connecting link, *i*, and the arm, *n*, on the valve spindle, whereby the valve, *A*, is caused to turn in its seat, *B*, until the perforations in the valve, *A*, are opposite the perforations in the valve seat, *B*, when the water will flow into the system of pipes and sprinklers to extinguish the fire.

The releasing device, *L*, is a tube having an inward projecting rim, through which a wire or rod passes, forming a guide and limit of motion to the rod: one end of the wire or rod is enlarged to nearly the size of the inside of the tube and is secured to the tube by an easily fusible solder, which, when a fire occurs and the temperature attains about 160°, will fuse and release the tube from a fixed position and leave it subject to the descent of the weight *s*, which, in its descent, will draw the tube along over the enlarged end of the rod until the enlargement brings up against the projecting rim on the inside of the tube: the length of movement is sufficient to allow the opening of the supply valve in the same manner as by the releasing device, *L*, producing the same results.

The releasing device, *ggg*, is a simple wire, or rod, having at intervals in its length easily fusible or inflammable connections which, when fused or destroyed, allow the wire or rods to separate and leave the weight, *s*, free to descend and open the valve and let the water into the system of pipes in the same manner as the other releasing devices and with like results.

The connecting links may be made of cane or wood which will not lengthen or contract by variable conditions of the atmosphere, as metallic connections would, and thereby affect the operation of the supply valve. *K* represents a connection made with rattan or cane.

With the ratchet device a simple and effective provision is made whereby the expansion or contraction of wire or metallic connections will not affect or operate the supply valve.

It will be seen that any number of arms may be attached either to the ratchet shaft, *k*, or to the spindle of the valve, and one will work independently of the others, and there need be but one line of wire running through the several floors to connect with the supply valve.

The sprinklers, marked *G*, are sealed with an easily fusible solder and are released from a closed position when the temperature in the room reaches 160° when the water flows through them on the fire, and they are released only where the fire is, thereby preventing flooding the building and causing unnecessary damage by water.

The releasing device, *L*, will stop the flow of water when a fire is extinguished and the temperature is reduced to its normal condition, for the reason that the fluid will return to its original bulk and the pressure of the atmosphere will force the piston back to the position it occupied before the fire occurred, or it may be forced back by auxiliary means, such as a spring or weight.

A FIRE EXTINGUISHER ADAPTED ESPECIALLY TO NICELY FINISHED APARTMENTS.

Cut No. 5 (on following page) is a sectional view of a fire extinguisher adapted especially to inside work, in nicely finished apartments, where pipes exposed to view would be unsightly.

Fig. 10.

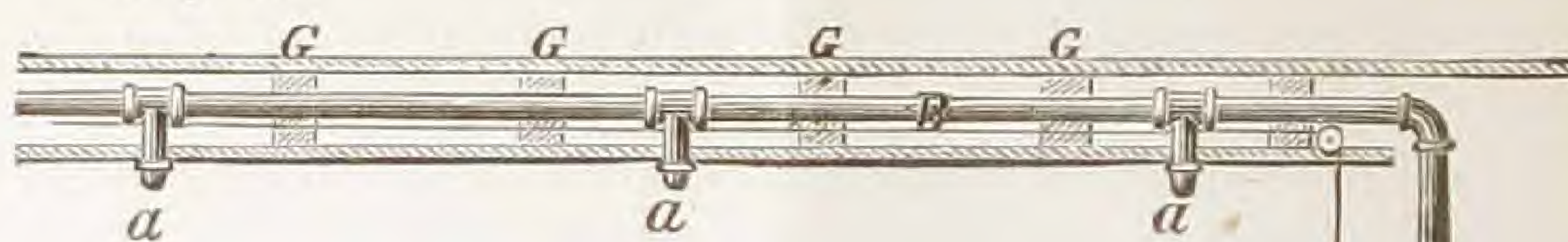


Fig. 11

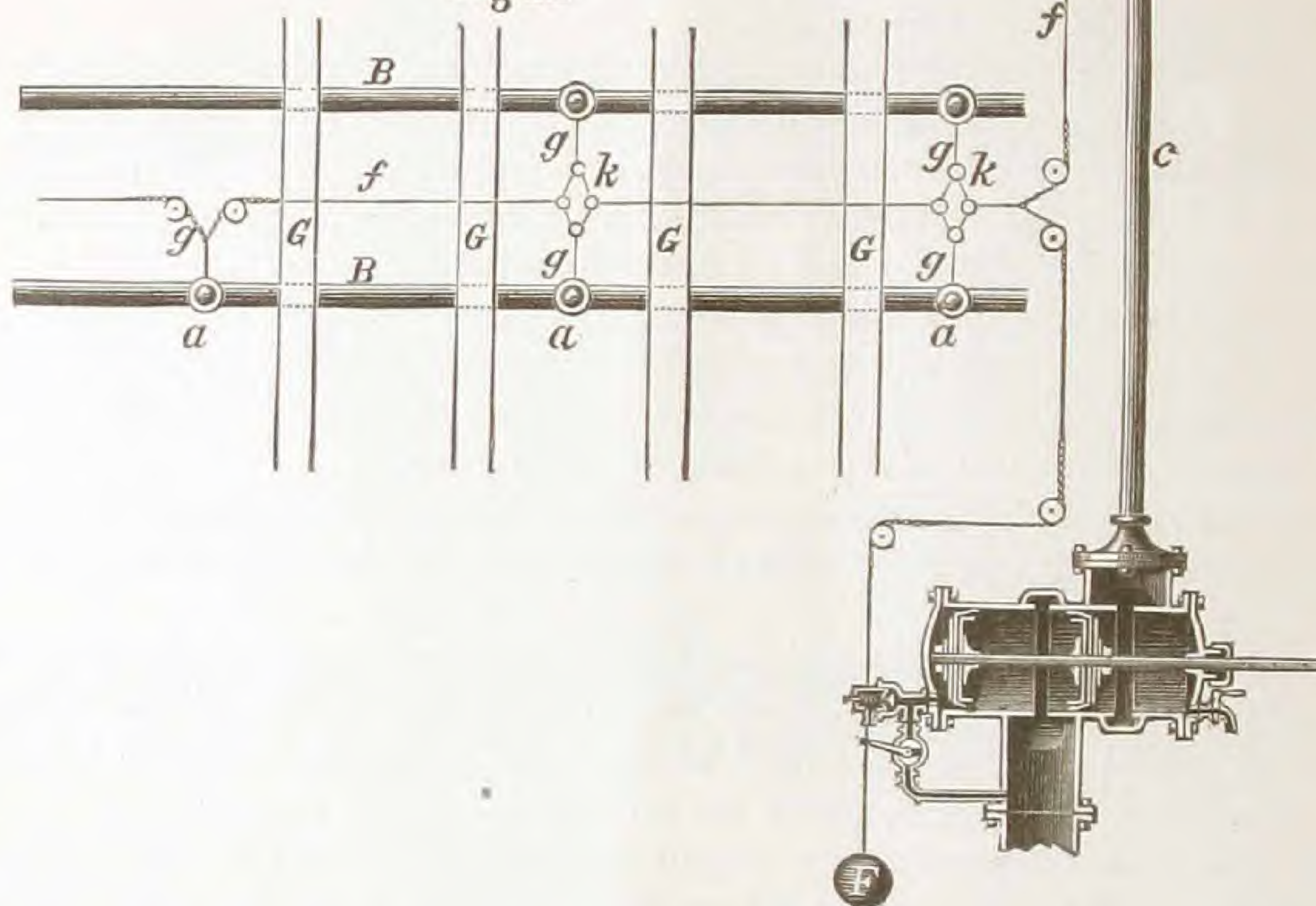


Fig. 10 shows the pipe, *B*, running through or upon the top of the joists, between a floor and ceiling, and the sprinklers, *a*, connected therewith, projecting from it; it shows also the connecting wire, *f*, to which is attached the releasing mechanism more plainly seen in Fig. 11; the pipe, *B*, is inserted into the elbow on the end of the rising main pipe, *c*, and by the pipe, *c*, communicates with the governor or supply valve at its lower end and with the water supply.

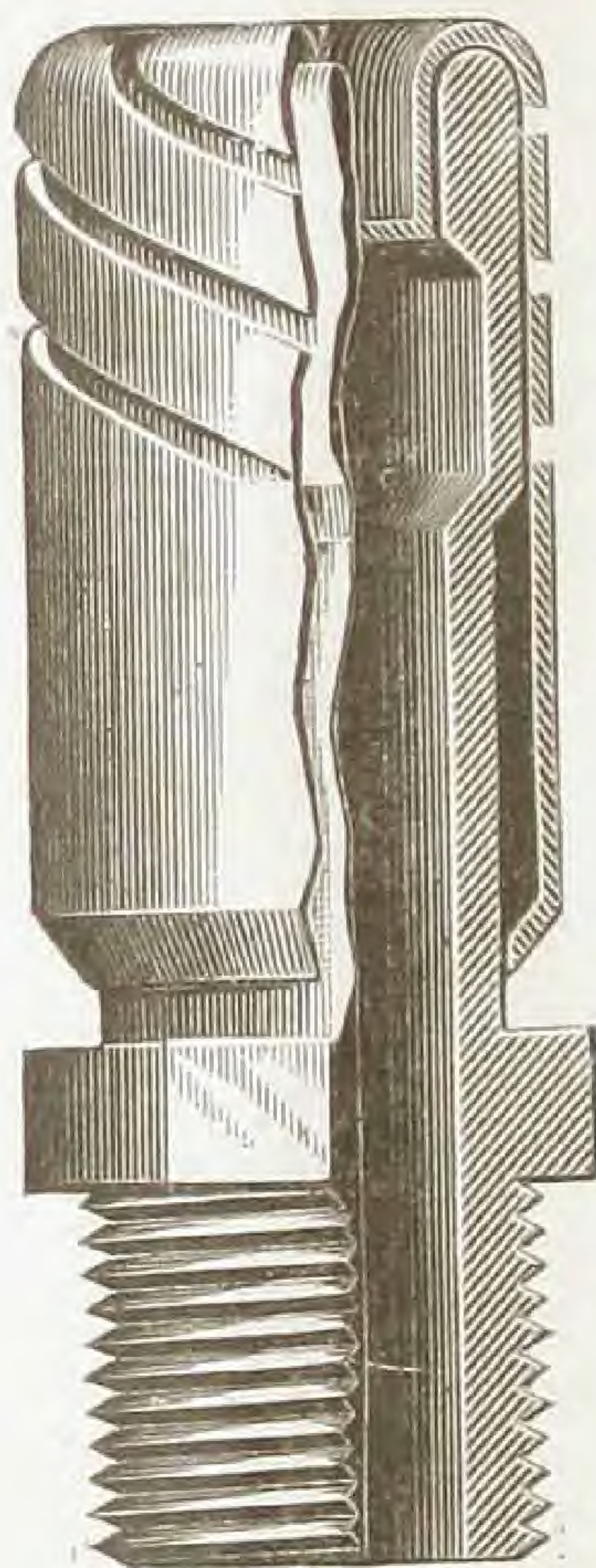
Fig. 11 is a view of the pipes, *B*, and the sprinklers, *a*, with the releasing devices, *k*, and the connecting wires, *f* and *g*, looking up from the floor below.

Beginning with the governor valve, a description of the apparatus and its operation is as follows. The governor valve is a cylinder, containing a piston rod, upon which there are two heads, some distance apart; the piston heads have a flexible cup shaped packing on their outer surface, by which means a tight and movable joint is made between the inner surface of the cylinder and the piston heads; the flexible packing is forced against the sides of the cylinder by the pressure of water, so that there can be no leakage of water between the surface of the cylinder and the packing. There are also an inlet and discharge pipe, connecting with the cylinder containing the double headed piston; the inlet is on the under side of the cylinder

joints are either flat surfaces or are made with flexible packing and their working parts are made of brass or composition. I warrant them to do all I claim for them.

OTHER FORMS OF DISTRIBUTERS.

No. 6.



The above cut (No. 6) shows another form of my distributor.

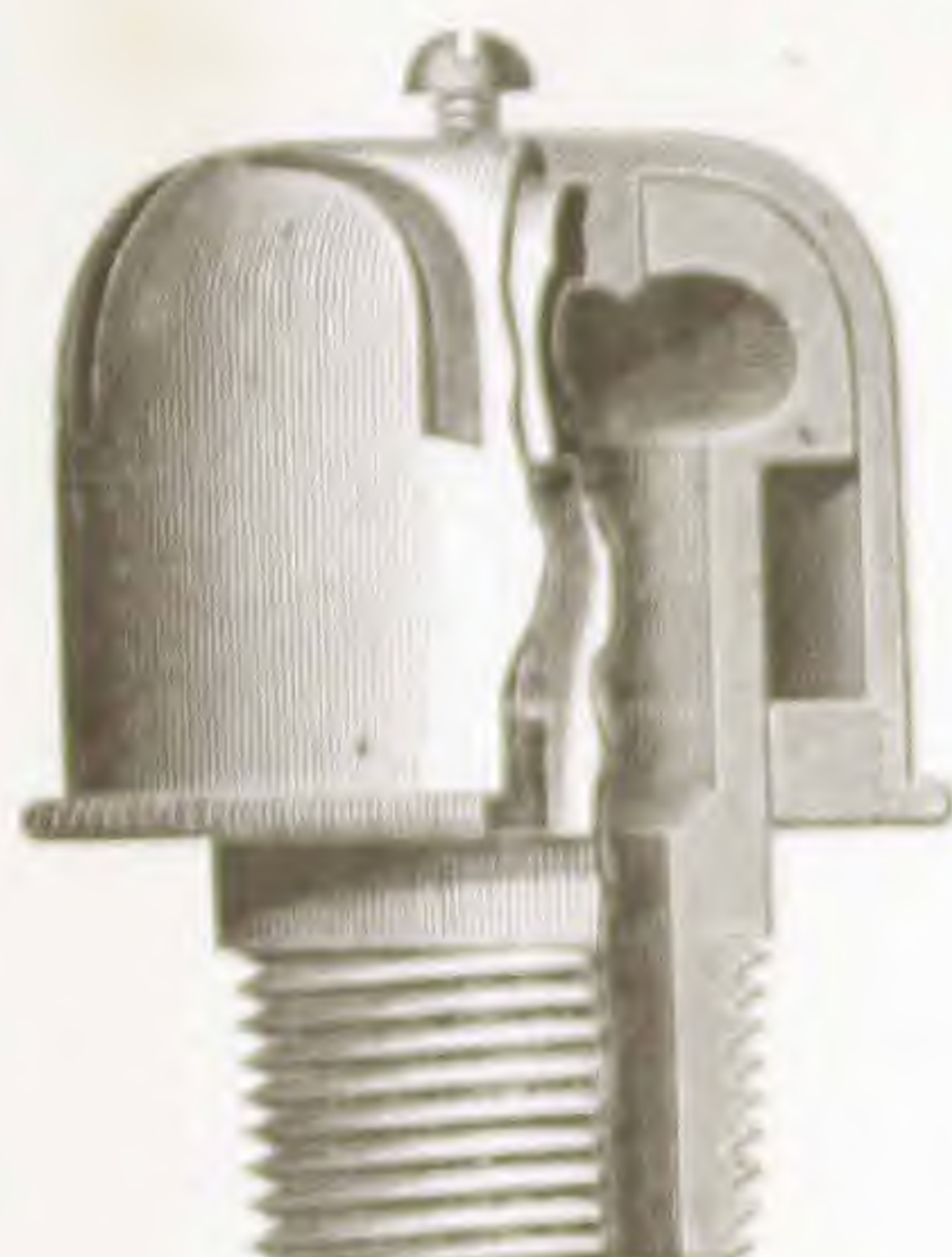
Instead of a tube having spiral slots, within the conduit pipe, a case having spiral slots or other perforations is placed over the conduit pipe, loosely fitting the same, the upper end being depressed and made to fit the inside of the conduit pipe, near its upper end, to which it is soldered with easily fusible metal, to be released therefrom by the heat generated by fire. This distributor needs no cap to prevent dirt, dust or fiber, from getting into it to impair its efficiency, as the case or distributor fits the conduit pipe so that no dirt can get in, and like the distributor shown in cut No. 2 it has no superior.

Cut No. 7 (on following page) shows another form of distributor.

With the slots cut as shown, it will revolve and distribute the water in a fine spray and is very effective for the surface it will cover, but it will not throw as much water as the other distributors of my invention, neither will it protect so large a space. It is protected from dirt getting into it in the

same manner as the distributor shown in cut No. 6. There may be spiral slots made in this distributor or simple perforations and it will be as effective as any other of that class. This distributor is held to the end or inside of the conduit pipe in the same manner as that in cut No. 6.

No. 7.



The screw in the top of the distributor is for the purpose of letting the air out of the pipes to prevent any fluctuation of pressure or motion of the water in the pipes, which is invariably the case whenever or wherever the pipes are put up having a simple check valve with a stem or projecting arm to which a whistle or other alarm is connected, to be operated by the movement of the valve; such an arrangement will give the alarm when there is no fire and is a source of complaint and annoyance. To be more explicit I would say that when a system of pipes is put up and the outlets are sealed and the water is let into the pipes, the water compresses and forces the air into the upper parts of the pipes and there it remains as a most sensitive cushion or spring accommodating itself to any variable pressure; for instance, when water is drawn from below the valve and the flow is suddenly stopped the momentum that the water has attained will cause it to rush through the valve, opening the same, thereby operating the alarms when not required, but with the air excluded from the pipes they are filled solid with water and the valve will remain on its seat until a fire occurs and releases one of the outlets, when the water will rush through the valve raising it off from its seat and giving the alarm, and there will be no mistake made or false alarm given. The screw can be used in any of my sprinklers.

This last method of protecting a building against serious loss or damage by fire will do the work but is not the best because of its cheapness.

NOTICE.

Any parties who may wish to put up Fire Extinguishing Apparatus under my patents, either by purchase of Territory Right or under Royalty, can make arrangements with me on reasonable terms.

I will furnish any parts of my apparatus to parties engaged in the business of steam and water piping, where I have not already made other arrangements, at reasonable rates.

RECENT IMPROVEMENTS
—IN—
AUTOMATIC FIRE EXTINGUISHERS.

NEW HAVEN, CONN.,

Oct. 20th, 1882.

Within the past year I have made numerous inventions and changes in apparatus for extinguishing fire and for preventing the flow of water after the fire is extinguished, or for preventing the escape of water if the pipes or fittings should be defective or broken by any cause whatever.

I have sprinklers adjustable to any pressure, which will work satisfactorily under two pounds pressure of water and are as sensitive as any made, which cannot get out of order or fail to do the work.

Persons wishing any information relative to my several devices and inventions will receive prompt attention by addressing me, at New Haven.

J. W. BISHOP.